

## SEQUENCE LISTING

&lt;110&gt; CYTHERIS

&lt;120&gt; IL-7 drug substance, composition, preparation and uses.

&lt;130&gt; B0131WO

&lt;140&gt;

&lt;141&gt;

&lt;160&gt; 23

&lt;170&gt; PatentIn Ver. 2.1

&lt;210&gt; 1

&lt;211&gt; 459

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: r-hIL-7 cDNA

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(459)

&lt;400&gt; 1

atg	gat	tgt	gat	att	gaa	ggt	aaa	gat	ggc	aaa	caa	tac	gag	tcc	gtt	48
Met	Asp	Cys	Asp	Ile	Glu	Gly	Lys	Asp	Gly	Lys	Gln	Tyr	Glu	Ser	Val	
1				5					10					15		

ctg	atg	gtc	agc	atc	gat	caa	tta	ttg	gac	agc	atg	aaa	gaa	att	ggt	96
Leu	Met	Val	Ser	Ile	Asp	Gln	Leu	Leu	Asp	Ser	Met	Lys	Glu	Ile	Gly	
20								25					30			

agc	aat	tgc	ctg	aat	aat	gaa	ttt	aac	ttt	ttt	aaa	aga	cat	atc	tgt	144
Ser	Asn	Cys	Leu	Asn	Asn	Glu	Phe	Asn	Phe	Phe	Lys	Arg	His	Ile	Cys	
35							40					45				

gat	gct	aat	aag	gaa	ggt	atg	ttt	tta	ttc	cgt	gct	gct	cgc	aag	ttg	192
Asp	Ala	Asn	Lys	Glu	Gly	Met	Phe	Leu	Phe	Arg	Ala	Ala	Arg	Lys	Leu	
50							55					60				

agg	caa	ttt	ctt	aaa	atg	aat	agc	act	ggt	gat	ttt	gat	ctc	cac	tta	240
Arg	Gln	Phe	Leu	Lys	Met	Asn	Ser	Thr	Gly	Asp	Phe	Asp	Leu	His	Leu	
65							70				75		80			

tta aaa gtt tca gaa ggc aca aca ata ctg ttg aac tgc act ggc cag	288		
Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn Cys Thr Gly Gln			
85	90	95	
gtt aaa gga aga aaa cca gct gcc ctg ggt gaa gcc caa cca aca aag	336		
Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala Gln Pro Thr Lys			
100	105	110	
agt ttg gaa gaa aat aaa tct tta aag gaa cag aaa aaa ctg aat gac	384		
Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp			
115	120	125	
ttg tgt ttc cta aag aga cta tta caa gag ata aaa act tgt tgg aat	432		
Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn			
130	135	140	
aaa att ttg atg ggc act aaa gaa cac	459		
Lys Ile Leu Met Gly Thr Lys Glu His			
145	150		
<210> 2			
<211> 153			
<212> PRT			
<213> Artificial Sequence			
<223> Description of Artificial Sequence: r-hIL-7 cDNA			
<400> 2			
Met Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val			
1	5	10	15
Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met Lys Glu Ile Gly			
20	25	30	
Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys Arg His Ile Cys			
35	40	45	
Asp Ala Asn Lys Glu Gly Met Phe Leu Phe Arg Ala Ala Arg Lys Leu			
50	55	60	
Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe Asp Leu His Leu			
65	70	75	80
Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn Cys Thr Gly Gln			
85	90	95	
Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala Gln Pro Thr Lys			
100	105	110	

Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp  
115 120 125

Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn  
130 135 140

Lys Ile Leu Met Gly Thr Lys Glu His  
145 150

<210> 3

<211> 531

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: r-hIL-7 cDNA

<220>

<221> CDS

<222> (1)..(531)

<400> 3

atg ttc cat gtt tct ttt agg tat atc ttt gga ctt cct ccc ctg atc 48  
Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile  
1 5 10 15

ctt gtt ctg ttg cca gta gca tca tct gat tgt gat att gaa ggt aaa 96  
Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys  
20 25 30

gat ggc aaa caa tac gag tcc gtt ctg atg gtc agc atc gat caa tta 144  
Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu  
35 40 45

ttg gac agc atg aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt 192  
Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe  
50 55 60

aac ttt ttt aaa aga cat atc tgt gat gct aat aag gaa ggt atg ttt 240  
Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe  
65 70 75 80

tta ttc cgt gct gct cgc aag ttg agg caa ttt ctt aaa atg aat agc 288  
Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser  
85 90 95

act ggt gat ttt gat ctc cac tta tta aaa gtt tca gaa ggc aca aca	336
Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr	
100	105
	110
ata ctg ttg aac tgc act ggc cag gtt aaa gga aga aaa cca gct gcc	384
Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala	
115	120
	125
ctg ggt gaa gcc caa cca aca aag agt ttg gaa gaa aat aaa tct tta	432
Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu	
130	135
	140
aag gaa cag aaa aaa ctg aat gac ttg tgt ttc cta aag aga cta tta	480
Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu	
145	150
	155
	160
caa gag ata aaa act tgt tgg aat aaa att ttg atg ggc act aaa gaa	528
Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu	
165	170
	175
cac	531
His	

&lt;210&gt; 4

&lt;211&gt; 177

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;223&gt; Description of Artificial Sequence: r-hIL-7 cDNA

&lt;400&gt; 4

Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile	
1	5
	10
	15

Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys	
20	25
	30

Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu	
35	40
	45

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe	
50	55
	60

Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe	
65	70
	75
	80

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser

85

90

95

Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr  
100 105 110

Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala  
115 120 125

Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu  
130 135 140

Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu  
145 150 155 160

Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu  
165 170 175

His

<210> 5

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 5

attccatatg gattgtgata ttgaaggtaa agatggc

37

<210> 6

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 6

agccggatcc ttatcagtgt tcttttagtgc ccatca

36

<210> 7

<211> 64

<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 7  
tagggaattc catatggatt gtgatattga aggtaaagat ggcaaacaat acgagtccgt 60  
tctg 64

<210> 8  
<211> 48  
<212> DNA  
<213> Artificial Sequence

<400> 8  
gcaagcttgc caccatgttc catgtttctt ttaggtataat ctttggac 48

<210> 9  
<211> 36  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: ptac1 primer

<400> 9  
atcgagatct aattctcatg tttgacagct tatcat 36

<210> 10  
<211> 38  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: ptac2 primer

<400> 10  
atcgctaga gctgtttcct gtgtgaaatt gtttatccg 38

<210> 11  
<211> 20  
<212> DNA  
<213> Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: tac promoter  
primer

&lt;400&gt; 11

ttcgtgtcg tcaaggcgca

20

&lt;210&gt; 12

&lt;211&gt; 531

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: PS-sIL-7 cDNA

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(531)

&lt;400&gt; 12

atg ttc cat gtt tct ttt agg tat atc ttt gga ctt cct ccc ctg atc 48  
Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile  
1 5 10 15ctt gtt ctg ttg cca gta gca tca tct gat tgt gat att gaa ggt aaa 96  
Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys  
20 25 30gat ggc aaa caa tac gag tcc gtt ctg atg gtc agc atc gat caa tta 144  
Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu  
35 40 45ttg gac agc atg aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt 192  
Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe  
50 55 60aac ttt ttt aaa aga cat cta tgt gat gat aat aag gaa ggt atg ttt 240  
Asn Phe Phe Lys Arg His Leu Cys Asp Asp Asn Lys Glu Gly Met Phe  
65 70 75 80tta ttc cgt gct gct cgc aag ttg agg caa ttt ctt aaa atg aat agc 288  
Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser  
85 90 95act ggt gat ttt gat ctc cac tta tta aaa gtt tca gaa ggc aca aca 336  
Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr

100	105	110	
ata ctg ttg aac tgc acc ggc aag gtt aaa gga aga aaa cca gct gcc Ile Leu Leu Asn Cys Thr Gly Lys Val Lys Gly Arg Lys Pro Ala Ala			384
115	120	125	
ctg ggt gaa ccc caa cca aca aag agt ttg gaa gaa aat aaa tct tta Leu Gly Glu Pro Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu			432
130	135	140	
aag gaa cag aaa aaa ctg aat gac tca tgt ttc cta aag aga cta cta Lys Glu Gln Lys Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg Leu Leu			480
145	150	155	160
caa aag ata aaa act tgt tgg aat aaa att ttg atg ggc act aaa gaa Gln Lys Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu			528
165	170	175	
cac His			531

&lt;210&gt; 13

&lt;211&gt; 177

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;223&gt; Description of Artificial Sequence: PS-sIL-7 cDNA

&lt;400&gt; 13

Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile			
1	5	10	15

Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys			
20	25	30	

Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu			
35	40	45	

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe			
50	55	60	

Asn Phe Phe Lys Arg His Leu Cys Asp Asp Asn Lys Glu Gly Met Phe			
65	70	75	80

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser			
85	90	95	

Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr

100                    105                    110  
Ile Leu Leu Asn Cys Thr Gly Lys Val Lys Gly Arg Lys Pro Ala Ala  
115                    120                    125  
  
Leu Gly Glu Pro Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu  
130                    135                    140  
  
Lys Glu Gln Lys Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg Leu Leu  
145                    150                    155                    160  
  
Gln Lys Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu  
165                    170                    175  
  
His

<210> 14  
<211> 28  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: BclXL5'NotI  
primer  
  
<400> 14  
tagcggccgc atgtctcaga gcaaccgg                    28

<210> 15  
<211> 28  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: BclXL3'BstBI  
primer  
  
<400> 15  
acttcgaatc atttccgact gaagagtg                    28

<210> 16  
<211> 537  
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: EPOPS-r-hIL-7  
cDNA

<220>

<221> CDS

<222> (1)..(537)

<400> 16

atg	ggg	gtg	cac	gaa	tgt	cct	gcc	tgg	ctg	tgg	ctt	ctc	ctg	tcc	ctg	48
Met	Gly	Val	His	Glu	Cys	Pro	Ala	Trp	Leu	Trp	Leu	Leu	Ser	Leu		
1									10					15		

ctg	tcg	ctc	cct	ctg	ggc	ctc	cca	gtc	ctg	ggc	gat	tgt	gat	att	gaa	96
Leu	Ser	Ileu	Pro	Leu	Gly	Leu	Pro	Val	Leu	Gly	Asp	Cys	Asp	Ile	Glu	
									25				30			

ggt	aaa	gat	ggc	aaa	caa	tac	gag	tcc	gtt	ctg	atg	gtc	agc	atc	gat	144
Gly	Lys	Asp	Gly	Lys	Gln	Tyr	Glu	Ser	Val	Leu	Met	Val	Ser	Ile	Asp	
									35			40		45		

caa	tta	ttg	gac	agc	atg	aaa	gaa	att	ggt	agc	aat	tgc	ctg	aat	aat	192
Gln	Leu	Leu	Asp	Ser	Met	Lys	Glu	Ile	Gly	Ser	Asn	Cys	Leu	Asn	Asn	
					50		55		60							

gaa	ttt	aac	ttt	ttt	aaa	aga	cat	atc	tgt	gat	gct	aat	aag	gaa	ggt	240
Glu	Phe	Asn	Phe	Phe	Lys	Arg	His	Ile	Cys	Asp	Ala	Asn	Lys	Glu	Gly	
					65		70		75			80				

atg	ttt	tta	ttc	cgt	gct	gct	cgc	aag	ttg	agg	caa	ttt	ctt	aaa	atg	288
Met	Phe	Leu	Phe	Arg	Ala	Ala	Arg	Lys	Leu	Arg	Gln	Phe	Leu	Lys	Met	
					85		90				95					

aat	agc	act	ggt	gat	ttt	gat	ctc	cac	tta	aaa	gtt	tca	gaa	ggc	336	
Asn	Ser	Thr	Gly	Asp	Phe	Asp	Leu	His	Leu	Leu	Lys	Val	Ser	Glu	Gly	
					100		105			110						

aca	aca	ata	ctg	ttg	aac	tgc	act	ggc	cag	gtt	aaa	gga	aga	aaa	cca	384
Thr	Thr	Ile	Leu	Leu	Asn	Cys	Thr	Gly	Gln	Val	Lys	Gly	Arg	Lys	Pro	
					115		120			125						

gct	gcc	ctg	ggt	gaa	gcc	caa	cca	aca	aag	agt	ttg	gaa	gaa	aat	aaa	432
Ala	Ala	Leu	Gly	Glu	Ala	Gln	Pro	Thr	Lys	Ser	Leu	Glu	Glu	Asn	Lys	
					130		135			140						

tct	tta	aag	gaa	cag	aaa	aaa	ctg	aat	gac	ttg	tgt	ttc	cta	aag	aga	480
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg  
145 150 155 160

ctt tta caa gag ata aaa act tgt tgg aat aaa att ttg atg ggc act 528  
Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr  
165 170 175

aaa gaa cac 537  
Lys Glu His

<210> 17

<211> 179

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: EPOPS-r-hIL-7  
cDNA

<400> 17

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Ser Leu  
1 5 10 15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Asp Cys Asp Ile Glu  
20 25 30

Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp  
35 40 45

Gln Leu Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn  
50 55 60

Glu Phe Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly  
65 70 75 80

Met Phe Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met  
85 90 95

Asn Ser Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly  
100 105 110

Thr Thr Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro  
115 120 125

Ala Ala Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys  
130 135 140

Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg  
145 150 155 160

Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr  
165 170 175

Lys Glu His

<210> 18

<211> 519

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

HMM38PS-r-hIL-7 cDNA

<220>

<221> CDS

<222> (1)..(519)

<400> 18

atg tgg tgg cgc ctg tgg ctg ctg ctg ctg ctg ctg ctg ctg tgg 48  
Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Leu Trp  
1 5 10 15

ccc atg gtg tgg gcc gat tgt gat att gaa ggt aaa gat ggc aaa caa 96  
Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln  
20 25 30

tac gag tcc gtt ctg atg gtc agc atc gat caa tta ttg gac agc atg 144  
Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met  
35 40 45

aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt aac ttt ttt aaa 192  
Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys  
50 55 60

aga cat atc tgt gat gct aat aag gaa ggt atg ttt tta ttc cgt gct 240  
Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe Leu Phe Arg Ala  
65 70 75 80

gct cgc aag ttg agg caa ttt ctt aaa atg aat agc act ggt gat ttt 288  
Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe  
85 90 95

gat ctc cac tta tta aaa gtt tca gaa ggc aca aca ata ctg ttg aac 336

Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn			
100	105	110	
tgc act ggc cag gtt aaa gga aga aaa cca gct gcc ctg ggt gaa gcc	384		
Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala			
115	120	125	
caa cca aca aag agt ttg gaa gaa aat aaa tct tta aag gaa cag aaa	432		
Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys			
130	135	140	
aaa ctg aat gac ttg tgt ttc cta aag aga cta tta caa gag ata aaa	480		
Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys			
145	150	155	160
act tgt tgg aat aaa att ttg atg ggc act aaa gaa cac	519		
Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His			
165	170		

&lt;210&gt; 19

&lt;211&gt; 173

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;223&gt; Description of Artificial Sequence:

HMM38PS-r-hIL-7 cDNA

&lt;400&gt; 19

Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Trp			
1	5	10	15

Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln			
20	25	30	

Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met			
35	40	45	

Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys			
50	55	60	

Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe Leu Phe Arg Ala			
65	70	75	80

Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe			
85	90	95	

Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn			
100	105	110	

Cys Thr Gly Gin Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala  
115 120 125

Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys  
130 135 140

Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys  
145 150 155 160

Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His  
165 170

<210> 20

<211> 537

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: EPOPS-sIL-7  
cDNA

<220>

<221> CDS

<222> (1)..(537)

<400> 20

atg ggg gtg cac gaa tgt cct gcc tgg ctg tgg ctt ctc ctg tcc ctg 48  
Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Ser Leu  
1 5 10 15

ctg tcg ctc cct ctg ggc ctc cca gtc ctg ggc gat tgt gat att gaa 96  
Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Asp Cys Asp Ile Glu  
20 25 30

ggt aaa gat ggc aaa caa tac gag tcc gtt ctg atg gtc agc atc gat 144  
Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp  
35 40 45

caa tta ttg gac agc atg aaa gaa att ggt agc aat tgc ctg aat aat 192  
Gln Leu Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn  
50 55 60

gaa ttt aac ttt ttt aaa aga cat cta tgt gat gat aat aag gaa ggt 240  
Glu Phe Asn Phe Phe Lys Arg His Leu Cys Asp Asp Asn Lys Glu Gly  
65 70 75 80

atg ttt tta ttc cgt gct gct cgc aag ttg agg caa ttt ctt aaa atg	288		
Met Phe Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met			
85	90	95	
aat agc act ggt gat ttt gat ctc cac tta tta aaa gtt tca gaa ggc	336		
Asn Ser Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly			
100	105	110	
aca aca ata ctg ttg aac tgc acc ggc aag gtt aaa gga aga aaa cca	384		
Thr Thr Ile Leu Leu Asn Cys Thr Gly Lys Val Lys Gly Arg Lys Pro			
115	120	125	
gct gcc ctg ggt gaa ccc caa cca aca aag agt ttg gaa gaa aat aaa	432		
Ala Ala Leu Gly Glu Pro Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys			
130	135	140	
tct tta aag gaa cag aaa aaa ctg aat gac tca tgt ttc cta aag aga	480		
Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg			
145	150	155	160
cta cta caa aag ata aaa act tgt tgg aat aaa att ttg atg ggc act	528		
Leu Leu Gln Lys Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr			
165	170	175	
aaa gaa cac	537		
Lys Glu His			

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Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Asp Cys Asp Ile Glu  
 20 25 30

Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp  
 35 40 45

Gln Leu Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn  
 50 55 60

Glu Phe Asn Phe Phe Lys Arg His Leu Cys Asp Asp Asn Lys Glu Gly  
65 70 75 80

Met Phe Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met  
85 90 95

Asn Ser Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly  
100 105 110

Thr Thr Ile Leu Leu Asn Cys Thr Gly Lys Val Lys Gly Arg Lys Pro  
115 120 125

Ala Ala Leu Gly Glu Pro Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys  
130 135 140

Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg  
145 150 155 160

Leu Leu Gln Lys Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr  
165 170 175

Lys Glu His

<210> 22

<211> 519

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HMM38PS-sIL-7  
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Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Trp  
1 5 10 15

ccc atg gtg tgg gcc gat tgt gat att gaa ggt aaa gat ggc aaa caa 96  
Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln  
20 25 30

tac gag tcc gtt ctg atg gtc agc atc gat caa tta ttg gac agc atg			144
Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met			
35	40	45	
aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt aac ttt ttt aaa			192
Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys			
50	55	60	
aga cat cta tgt gat gat aat aag gaa ggt atg ttt tta ttc cgt gct			240
Arg His Leu Cys Asp Asp Asn Lys Glu Gly Met Phe Leu Phe Arg Ala			
65	70	75	80
gct cgc aag ttg agg caa ttt ctt aaa atg aat agc act ggt gat ttt			288
Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe			
85	90	95	
gat ctc cac tta tta aaa gtt tca gaa ggc aca aca ata ctg ttg aac			336
Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn			
100	105	110	
tgc acc ggc aag gtt aaa gga aga aaa cca gct gcc ctg ggt gaa ccc			384
Cys Thr Gly Lys Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Pro			
115	120	125	
caa cca aca aag agt ttg gaa gaa aat aaa tct tta aag gaa cag aaa			432
Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys			
130	135	140	
aaa ctg aat gac tca tgt ttc cta aag aga cta cta caa aag ata aaa			480
Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg Leu Leu Gln Lys Ile Lys			
145	150	155	160
act tgt tgg aat aaa att ttg atg ggc act aaa gaa cac			519
Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His			
165	170		

<210> 23  
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<212> PRT  
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<223> Description of Artificial Sequence: HMM38PS-sIL-7  
cDNA

<400> 23  
Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Trp  
1 5 10 15

Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln  
20 25 30

Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met  
35 40 45

Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys  
50 55 60

Arg His Leu Cys Asp Asp Asn Lys Glu Gly Met Phe Leu Phe Arg Ala  
65 70 75 80

Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe  
85 90 95

Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn  
100 105 110

Cys Thr Gly Lys Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Pro  
115 120 125

Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys  
130 135 140

Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg Leu Leu Gln Lys Ile Lys  
145 150 155 160

Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His  
165 170